ADA-compliant features, on bridges crossing the freeway and their detours will also be identified in the Final TMP.

### 3.1.6.4 Avoidance, Minimization, and/or Mitigation Measures

Measures are presented below for each of the adverse effects to traffic identified above. Table 3.1.6-21 presents v/c and LOS information under project conditions with mitigation for locations in Orange County. The table provides a comparison of the no-build conditions and the project with mitigations. The table shows that there are no adverse effects to traffic under project conditions when the mitigations identified below are included.

#### *Detour Routes during Project Construction*

**T-1** A Final TMP will be prepared prior to project construction that identifies methods to avoid and minimize construction-related traffic and circulation effects and minimize impacts to pedestrian and bicycle access, including ADA-compliant features, as a result of the proposed project. During construction, the contractor shall implement the methods identified in the Final TMP.

Additional measures during project construction are presented in Section 3.1.4.1.4, Community Character and Cohesion (Avoidance, Minimization, and/or Mitigation Measures).

#### *Slater Avenue at Brookhurst Street*

**T-2** During final design, plans shall be prepared to incorporate the following improvements at the Slater Avenue/Brookhurst Street intersection, which the contractor shall implement during construction:

Convert the southbound right-turn lane on Brookhurst Street to a fourth through lane (with right turns shared).

Convert the existing second eastbound through lane on Slater Avenue at Brookhurst Street to a shared through/right-turn lane. Retain the existing eastbound exclusive right-turn lane.

Provide increased queue storage areas for northbound right-turn, northbound left-turn, eastbound right-turn, and westbound left-turn movements.

#### *Talbert Avenue at Brookhurst Street*

**T-3** During final design, plans shall be prepared to incorporate the following improvements at the Talbert Avenue/Brookhurst Street intersection, which the contractor shall implement during construction:

Add a third westbound through lane on Talbert Avenue. Retain the existing westbound exclusive right-turn lane.

Convert the southbound right-turn lane on Brookhurst Street to a fourth through lane (with right turns shared).

Convert the eastbound right-turn lane on Talbert Avenue to a fourth through lane (with right turns shared).

Convert the existing third northbound through lane on Brookhurst Street to a shared through/right-turn lane. Retain the existing northbound exclusive right-turn lane.

### *Warner Avenue at Magnolia Street*

**T-4** During final design, plans shall be prepared to incorporate the following improvements at the Warner Avenue/Magnolia Street intersection, which the contractor shall implement during construction:

Convert the southbound right-turn lane on Magnolia Street at Warner Avenue to a shared through/right-turn lane. Extend the third southbound through lane on Magnolia Street south of the intersection.

Provide dual northbound left-turn lanes on Magnolia Street at Warner Avenue.

Extend the southbound dual left-turn pocket from the existing 200 ft to approximately 440 ft of queue storage.

### *McFadden Avenue at Beach Boulevard*

**T-5** During final design, plans shall be prepared to incorporate the following improvements at the McFadden Avenue/Beach Boulevard intersection, which the contractor shall implement during construction:

Provide an exclusive northbound right-turn lane on Beach Boulevard.

Provide increased queue storage areas for eastbound right-turn and westbound left-turn movements.

### *Center Avenue at Beach Boulevard*

**T-6** During final design, plans shall be prepared to incorporate the following improvements at the Center Avenue/Beach Boulevard intersection, which the contractor shall implement during construction:

Provide an exclusive right-turn lane and a shared through/right-turn lane on southbound Beach Boulevard.

Add a third eastbound right-turn lane on Center Avenue at Beach Boulevard. Increase the eastbound Center Avenue left-turn queue storage to 270 ft per lane and right-turn queue storage to 450 ft per lane.

Provide a fifth northbound through lane on Beach Boulevard.

### *Edinger Avenue at Beach Boulevard*

**T-7** During final design, plans shall be prepared to incorporate the following improvements at the Edinger Avenue/Beach Boulevard intersection, which the contractor shall implement during construction:

Add a fourth northbound through lane on Beach Boulevard at Edinger Avenue.

Convert the existing eastbound right-turn only lane on Edinger Avenue at Beach Boulevard to a fourth through lane (with a shared right turn) and extend the lane to Parkside Lane to increase vehicle queue storage. Sign and stripe to allow two curb lanes on eastbound Edinger Avenue at Beach Boulevard as freeway access lanes (to the southbound on-ramp at Edinger Avenue).

Extend the existing southbound dual left-turn lanes on Beach Boulevard from the existing queue storage of 240 ft to an average of 300 ft per lane.

Widen the Edinger Avenue overcrossing to provide two westbound through lanes and two eastbound through lanes. The third eastbound through lane on Edinger Avenue from Beach Boulevard is dropped at the bridge overcrossing.

At the intersection of eastbound Edinger Avenue and the I-405 southbound on-ramp, provide an exclusive right-turn and a shared through/right-turn lane on eastbound Edinger Avenue, thereby allowing two lanes onto the southbound ramp.

Provide increased queue storage areas for southbound left-turn, eastbound left-turn, and westbound left-turn movements.

### *Bolsa Avenue at Goldenwest Street*

**T-8** During final design, plans shall be prepared to incorporate the following improvements at the Bolsa Avenue/Goldenwest Street intersection, which the contractor shall implement during construction:

Widen the southbound approach on Goldenwest Street to provide an exclusive right-turn lane and a second left-turn lane. The southbound left-turn pocket is extended past the Goldenwest Street/Westminster Mall Road intersection.

Widen the northbound approach on Goldenwest Street at Bolsa Avenue to provide an exclusive right-turn lane with queue storage of approximately 430 ft.

Convert the eastbound right-turn lane on Bolsa Avenue to a fourth through lane (with right turns shared). Widen the south side of Bolsa Avenue between Goldenwest Street and the I-405 southbound on-ramp. Sign and stripe to allow two curb lanes on eastbound Bolsa Avenue at Goldenwest Street as freeway access lanes (to the I-405 southbound on-ramp from Bolsa Avenue).

Widen the westbound approach to provide extended queue storage of 750 ft for the right-turn lane and increased queue storage of 280 ft for the left-turn lanes.

### *Garden Grove Boulevard at Bolsa Chica Road/Valley View Street*

**T-9** During final design, plans shall be prepared to incorporate the following improvements at the Garden Grove Boulevard and Bolsa Chica Road/Valley View Street intersection, which the contractor shall implement during construction:

Add a third westbound right-turn lane on Garden Grove Boulevard.

Add a third through lane on northbound Bolsa Chica Road/Valley View Street.

Extend the northbound right-turn lane on Bolsa Chica Road/Valley View Street and increase the existing queue storage of 400 ft to approximately 800 ft.

Proposed traffic measures are presented below for each of the project contributions to adverse cumulative effects in Los Angeles County identified above. Figures illustrating recommended improvements are included in Appendix L3. Tables 3.1.6-27, 3.1.6-29, and 3.1.6-31 present v/c and LOS information with proposed traffic measures under Alternatives 1, 2, and 3 conditions, respectively. The tables provide comparisons of the no-build conditions and the project condition with the proposed traffic measures. The tables show that there are no project contributions to adverse cumulative effects in Los Angeles County with implementation of the proposed traffic measures identified below.

The proposed measures include fair share contributions. OCTA/Caltrans arethe project sponsors for the project. OCTA/Caltrans will contribute towards the fair share mitigation for T-10 and T-11, and OCTA will contribute for T-11. As the project sponsor, OCTA will provide a fair share amount of funding to address significant cumulative impacts to traffic. This funding will be provided to the City of Long Beach and to Caltrans.

Appendix L4 presents the data on which the fair share contribution percentages are based. The project's fair share percentage is calculated for each of the intersections identified with an adverse cumulative effect for Alternatives 1, 2, and 3. The fair share percentage calculation is adapted from the equitable share responsibility method included in the Caltrans Guide for the Preparation of Traffic Impact Studies, Appendix B. Because the Caltrans method is intended for

land development projects, the equation has been modified to be used for a roadway improvement project. The fair share percentage equation is as follows:

$$P = \frac{T}{T_B - T_E}$$

P = The equitable share for the proposed project's cumulative traffic impact expressed as a percentage.

T = Additional traffic volume entering the intersection during the peak hour assuming the project compared to the No Build Alternative in vehicles per hour, vph.

$T_B$ = The forecasted volume with the project entering the intersection during the peak hour assuming the project, vph.

$T_E$ = The existing traffic volume entering the intersection during the peak hour, vph.

For those intersections with an adverse cumulative effect in both the morning and evening peak hour, the larger T value is from the two periods and determines which period is used in the calculation. The T value for the 7th Street/Bellflower Boulevard intersection is negative for Alternative 1, rendering the calculation ineffective; therefore, the P value from the closest intersection (#30) is used as a reasonable substitute. Fair share percentage calculations are shown in Appendix L4.

### *City of Long Beach Intersections*

**T-10** A payment shall be made by OCTA (Phase 1) and Caltrans (Phase 2) to the City of Long Beach based on a Cooperative Agreement to be negotiated and executed between OCTA/Caltrans and the City of Long Beach. The Cooperative Agreement shall identify the project's fair share of the costs for the improvements at intersections owned by the City of Long Beach based on the Preferred Alternative (PA) and in accordance with the fair share percentages for each location identified below. The Cooperative Agreement shall provide:

That the City of Long Beach's Transportation Mitigation Program will be revised to include the locations listed below under A, B, or C for the PA;

That the payment made by OCTA shall be placed into the City of Long Beach Transportation Mitigation Program and shall only be used to provide improvements to remedy impacts of the PA at the intersections listed below under A, B, or C for the PA;

The amount of the total payment to be applied to each location; and

That the proposed improvements shall be implemented by the City of Long Beach, with the City of Long Beach bearing responsibility for necessary clearances and permits.

If the implementing agency of this measure decides not to move forward with these improvements, these cumulative impacts would remain adverse.

A. If PA is Alternative 1:

- Los Coyotes Diagonal and Bellflower Boulevard intersection:
  - Add a second left-turn lane to eastbound approach.
  - Fair Share Percentage: 4.45%. (estimated total construction cost in 2013 dollars is $250,000)

B. If PA is Alternative 2:

- Willow Street and Bellflower Boulevard intersection:
  - Add an exclusive right-turn lane to eastbound approach;
  - Add a second left-turn lane to westbound approach; and
  - Add a second left-turn lane to southbound approach.
  - Fair Share Percentage: 10.41%. (estimated total construction cost in 2013 dollars is $810,000)
- Willow Street and Los Coyotes Diagonal intersection:
  - Add a second left-turn lane to eastbound approach; and
  - Add a second left-turn lane to southbound approach.
  - Fair Share Percentage: 31.57%. (estimated total construction cost in 2013 dollars is $440,000)
- Willow Street and Woodruff Avenue intersection:
  - Add a second left-turn lane to northbound approach.
  - Fair Share Percentage: 10.40%. (estimated total construction cost in 2013 dollars is $240,000)

C. If PA is Alternative 3:

- Willow Street and Bellflower Boulevard intersection:
  - Add an exclusive right-turn lane to eastbound approach;
  - Add a second left-turn lane to westbound approach; and
  - Add a second left-turn lane to southbound approach.

- Fair Share Percentage: 10.41%. (estimated total construction cost in 2013 dollars is $810,000)

- Los Coyotes Diagonal and Bellflower Boulevard intersection:
  - Add a second left-turn lane to eastbound approach.
  - Fair Share Percentage: 8.32%. (estimated total construction cost in 2013 dollars is $250,000)
- Willow Street and Los Coyotes Diagonal intersection:
  - Add a second left-turn lane to eastbound approach; and
  - Add a second left-turn lane to southbound approach.
  - Fair Share Percentage: 30.03%. (estimated total construction cost in 2013 dollars is $440,000)

### *State of California Intersections*

**T-11** A payment shall be made by OCTA to Caltrans based on a Traffic Mitigation Agreement Fair Share Deferment to be negotiated and executed between OCTA and Caltrans. The Traffic Mitigation Agreement Fair Share Deferment shall identify the project's fair share of the costs for the improvements at intersections owned by the State of California based on the PA and in accordance with the fair share percentages for each location identified below. The Traffic Mitigation Agreement Fair Share Deferment shall provide:

That Caltrans will establish separate accounts for each of the locations listed below under A, B, or C for the PA;

That the payment made by OCTA shall be held by Caltrans and shall only be used to provide improvements to remedy impacts of the PA at the intersections listed below under A, B, or C for the PA;

The amount of the total payment to be applied to each location;

That the amounts for different locations shall not be commingled; and

That the proposed improvements shall be implemented by Caltrans, with Caltrans bearing responsibility for necessary clearances and permits.

If the implementing agency of this measure decides not to move forward with these improvements, these cumulative impacts would remain adverse.

It should be noted that the State of California would implement a project only when enough funds have been collectively received for that specific mitigation measure.

A. If PA is Alternative 1:

- SR-22 westbound on-/off-ramp and College Park Drive intersection:
  - Add a second northbound through lane to the off-ramp approach to College Park Drive starting approximately 300 ft south of their intersection; and
  - Replace existing traffic control with a traffic signal.
  - Fair Share Percentage: 12.11%. (estimated total construction cost in 2013 dollars is $1,570,000)
- 7th Street and Pacific Coast Highway intersection:
  - Add protected/permitted signal phasing to the eastbound and westbound approaches of Pacific Coast Highway to Bellflower Boulevard.
  - Fair Share Percentage: 11.70%. (estimated total construction cost in 2013 dollars is $450,000)
- 7th Street and West Campus Drive intersection:
  - Add an exclusive right-turn lane to westbound approach, modifying traffic signals as needed.
  - Fair Share Percentage: 9.16%. (estimated total construction cost in 2013 dollars is $300,000)
- 7th Street and Bellflower Boulevard intersection:
  - Add a second left-turn lane to eastbound approach, modifying signals and adjusting sidewalk as necessary.
  - Fair Share Percentage: 11.70%. (estimated total construction cost in 2013 dollars is $640,000)

B. If PA is Alternative 2:

- SR-22 westbound on-/off-ramp and College Park Drive intersection:
  - Add a second northbound through lane to the off-ramp approach to College Park Drive starting approximately 300 ft south of their intersection; and
  - Replace existing traffic control with a traffic signal.
  - Fair Share Percentage: 33.25%. (estimated total construction cost in 2013 dollars is $1,570,000)
- 7th Street and Pacific Coast Highway intersection:
  - Add protected/permitted signal phasing to the eastbound and westbound approaches of Pacific Coast Highway to Bellflower Boulevard.

- Fair Share Percentage: 7.84%. (estimated total construction cost in 2013 dollars is $450,000)

- 7th Street and Bellflower Boulevard intersection:
  - Add a second left-turn lane to eastbound approach, modifying signals and adjusting sidewalk as necessary.
  - Fair Share Percentage: 16.92%. (estimated total construction cost in 2013 dollars is $640,000)
- 7th Street and Channel Drive intersection:
  - Add a second left-turn lane to westbound approach, modifying signals as necessary; and
  - Provide dual southbound exclusive left-turn lanes.
  - Fair Share Percentage: 13.59%. (estimated total construction cost in 2013 dollars is $240,000)
- 7th Street and West Campus Drive intersection:
  - Add an exclusive right-turn lane to westbound approach, modifying traffic signals as necessary.
  - Fair Share Percentage: 27.34%. (estimated total construction cost in 2013 dollars is $300,000)
- 7th Street and East Campus Drive intersection:
  - Add a right-turn lane to westbound approach, modifying traffic signals as necessary and maximizing eastbound and westbound left-turn pocket lengths.
  - Fair Share Percentage: 21.30%. (estimated total construction cost in 2013 dollars is $450,000)

C. If PA is Alternative 3:

- 7th Street and Pacific Coast Highway intersection:
  - Add protected/permitted signal phasing to the eastbound and westbound approaches of Pacific Coast Highway to Bellflower Boulevard.
  - Fair Share Percentage: 8.08%. (estimated total construction cost in 2013 dollars is $450,000)
- 7th Street and Bellflower Boulevard intersection:

- Add a second left-turn lane to eastbound approach, modifying signals and adjusting sidewalk as necessary.
- Fair Share Percentage: 17.64%. (estimated total construction cost in 2013 dollars is $640,000)

- 7th Street and Channel Drive intersection:
  - Add a second left-turn lane to westbound approach, modifying signals as necessary; and
  - Provide dual southbound exclusive left-turn lanes.
  - Fair Share Percentage: 14.01%. (estimated total construction cost in 2013 dollars is $240,000)
- 7th Street and West Campus Drive intersection:
  - Add an exclusive right-turn lane to westbound approach, modifying traffic signals as necessary.
  - Fair Share Percentage: 25.02%. (estimated total construction cost in 2013 dollars is $300,000)
- 7th Street and East Campus Drive intersection:
  - Add a right-turn lane to westbound approach, modifying traffic signals as necessary and maximizing eastbound and westbound left-turn pocket lengths.
  - Fair Share Percentage: 7.39%. (estimated total construction cost in 2013 dollars is $450,000)

### *HOV Occupancy Policy on the Express Lanes*

**T-12** To address the potential operational challenge on the express lanes (under the HOV2+ free policy), a process will be developed to address the issue by considering HOV occupancy policy which may include, but not limited to:

- adjusting to HOV3+ free with HOV2s discounted tolls
- adjusting to HOV3+ free with HOV2s full tolls
- adjusting to tolling HOV2s on individual tolling segments such as direct connectors to or from other freeways
- periodic adjustments of tolling rates to maintain operations on individual tolling segments